

ON THE USE

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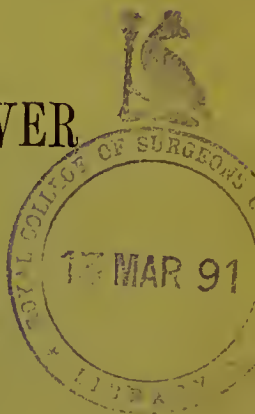
OIL OF EUCALYPTUS GLOBULUS

COMBINED WITH OTHER ANTISEPTICS,

IN THE

TREATMENT OF SCARLET FEVER

AND ALL INFECTIOUS DISEASES.



BY

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*Read at a Meeting of the Epidemiological Society, on March 12th, 1890, and published in
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EPIDEMIOLOGICAL SOCIETY OF LONDON.

WEDNESDAY, MARCH 12TH, 1890.

Sir T. Crawford, K.C.B., M.D., President, in the Chair.

Eucalyptus in Scarletina.—Mr. J. B. CURGENVEN, in introducing the subject of the treatment of scarlatina with oil of eucalyptus, which he had practised for the last twelve months, and which he believed to be equally applicable to other infectious diseases, claimed for it that it was capable of superseding all other curative and preventive measures, and of rendering unnecessary all attempts at isolation of the sick; disinfection, beyond what itself effected, of clothing, bedding, furniture and rooms; and, except so far as better nursing accommodation, etc., were concerned, the costly establishment of special hospitals for infectious diseases. Quoting Dr. Lauder Brunton's belief that a germicide which might circulate in the blood without injury to the living body, though still unknown, was not inconceivable, he maintained that the essential oils of eucalyptus, thymol and others were such. Reviewing previous attempts at superficial or local corporal disinfection, he insisted on the inefficacy of carbolic acid except so concentrated as to be caustic, on the danger of absorption from the use of sublimate solutions over extensive surfaces, on the action of fixed oils and fats in neutralising the germicidal properties of chemical bodies and their injurious influence in checking the functions of the skin, which more than counterbalanced the lessened dispersion of the cuticle or disease germs which was aimed at in their use, first proposed by the late Dr. W. Budd twenty years since. Permanganate of potash, though not poisonous, was objectionable, and Sanitas unsuitable. But oil of eucalyptus was perfectly innocuous, a powerful germicide, and extremely volatile, thus possessing every advantage, positive and negative; while on the principle advanced by Dr. Paris, that a number of drugs of the properties combined in small proportions were more effective than larger quantities of one of them alone, he preferred "Tucker's Eucalyptus Antiseptic," which contained in addition thymol and several essential oils and camphors, to the eucalyptus oil itself. He gave it internally in frequent doses of a few drops shaken-up in water; he sprinkled the clothing, sheets, pillows, etc., with it, and rubbed it over the entire surface of the body twice a day, besides sprinkling the floor, furniture, walls, etc., till the air of the apartment was impregnated with the not unpleasant odour. He had not practised spraying of the throat, but, in reply to a member present, said that in severe cases, and certainly in diphtheria, he would consider such a procedure advisable. The results he had invariably obtained were the immediate arrest of the eruption, which did not extend further, the speedy relief of angina and subsidence of enlarged glands, rapid defervescence of the fever, the temperature falling from 104° or 105° to 100° or even to normal within a few hours, and the entire absence of albuminuria due to the elimination of such oils by the kidneys; in short, the immediate arrest and cure of the disease. Further, it was, he maintained, no less effective in aborting the disease if the treatment were commenced when the symptoms of invasion had appeared, but the eruption, etc., had not been manifested; and lastly, in protecting the most susceptible persons against infection, even though they remained exposed to it, adducing the case, among others, of five young children who could not be supposed to be all of them insusceptible, none having had the fever before, in a small room where a sixth lay ill, the mother refusing to part with her sick child, and being unable to send the others away, or even to remove them from what was her only apartment. He believed his cases to be numerous enough to exclude fallacies of natural early subsidence of the fever, great resisting power or insusceptibility on the part of other children, and in fact all elements of chance.

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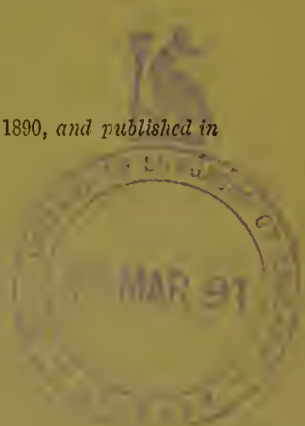
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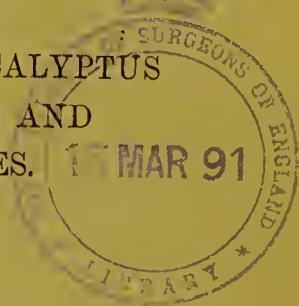
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ON THE USE OF THE OIL OF EUCALYPTUS
GLOBULUS IN SCARLET FEVER AND
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BY J. B. CURGENVEN, M.R.C.S.



I MUST apologise to the members for reading to them a disjointed paper, as it has been written at odd moments as time could be snatched from the absorbing occupation of attendance on patients suffering from the late epidemic of influenza.

Everyone must acknowledge the importance of the subject of disinfection in cases of scarlet fever and other infectious diseases, especially so, as, within the last few years, considerable sums of public money have been, and are being now, spent in erecting large fever hospitals for these cases. I hope to show that, by a method of disinfection which I have practised for nearly twelve months, this heavy burden on the ratepayers may be saved, and the cases treated in their own homes without risk to those around them.

The disinfectant that I have used is eucalyptus oil with thymol and other camphors and aromatic antiseptics in solution in definite proportions, much stronger than has been found by experiment to be sufficient, singly, to destroy anthrax spores, bacilli, and bacteriæ; and I consider that for all infectious diseases no stronger or safer disinfectant could be used. These aromatic and camphoraceous disinfectants, mixed with olive oil, fats, vascline, or alcohol to the extent of five per cent., have no influence on bacilli or bacteriæ.

MM. Widal and Chantemesse, in a series of careful researches on the bacillus of diphtheria, have observed that the solution of Dr. Soulez, which consists of 5 grammes of carbolic acid, 20 grammes of camphor, and 30 grammes of olive oil, does not arrest the cultivation of the bacillus, but renders it slower. These investigators think that this negative result is owing to the presence of the olive oil.

Dr. Davis, in the *Medical Annual*, 1890, says: "The inertness of carbolic and thymol oils is remarkable, but does not contraindicate their use as a local application in the desquamative stages of eruptive fevers to prevent contamination of the air by infectious particles. As the action is probably mechanical, inunction with vaseline would perhaps suffice; but the addition of thymol or carbolic or camphor may possibly be more grateful to the patient." His idea in the use of these disinfectants was that they simply rendered the oil or vaseline "more grateful to the patient" in carrying out the method of inunction as proposed by the late Dr. Budd of Bristol. That method I have tried, but the oil soon became rancid from the heat of the body, and the linen had to be changed every day; while, if it prevented the cuticle from dispersion in the air, it could not prevent the infective germs from passing freely from the patient in his breath and perspiration.

Dr. Bucholtz found eucalyptus oil to be three times stronger than carbolic acid, for while the latter required a strength of 1 in 200 to prevent putrefaction, eucalyptus oil only required a strength of 1 in 666 to produce the same effect. Siegen found that blood to which one-third per cent. of the oil had been added was odourless at the end of ten days. Dr. Lascelles Scott says that it is three and a half times more powerful than carbolic acid as a bacterial antiseptic. Mr. Mayo Robson proved by experiments that the vapour of eucalyptus oil given off at the ordinary temperature of the air preserved sterilised hay-infusion from the development of bacteria, and he says, "it may so saturate the air as to kill all infective particles, not only bacteria and micrococci, but also the germs of fevers and other infectious diseases."

"The vapour of carbolic acid at ordinary temperatures", Dr. Franklin Parsons tells us, "had no destructive effect on spore-bearing bacilli, though some effect was produced at elevated temperatures." Of what use, then, is the carbolic sheet over the door, and the vapour of carbolic acid in the air of the room occupied by a scarlet-fever patient?

Professor Lister in 1881, when in the chair of the Clinical Society, said: "It had been stated that there was no antiseptic that could with safety replace carbolic acid, though several had been tried, but he was in a position to say that the oil of eucalyptus globulus, if used properly, is a powerful and perfectly reliable antiseptic, and is also quite unirritating and without toxic effects."

Dr. Lauder Brunton, in his Croonian Lectures in 1889,

said that "it is not, moreover, *à priori* impossible to imagine that antiseptics circulating in the blood-stream may be germicidal to pathogenic organisms, the results of which are seen in disease. Up to the present time, however, all trials with such an idea seem to have been without beneficial effect."

My experience proves that the vapour of eucalyptus destroys not only the spores of the pathogenic bacillus of scarlet fever, but the bacillus itself after it has set up the pathological train of symptoms constituting the fever, and is being rapidly generated in the blood and tissues of the patient.

Thymol and other disinfectants, when dissolved in an essential oil, retain their power; and a combination of these aromatic and camphoraceous disinfectants forms as powerful a solution as can be required for the destruction of any infectious poison. It was an axiom of Dr. Paris that a combination of several therapeutic agents, in smaller proportion than is required by any one singly to take effect, produces a far greater and a better effect than any one in a larger proportion. The same rule is applicable to disinfectants; a better and a stronger effect is obtained by mixing several together, for while any one singly of the strength used would have no effect, their combined action is most powerful. I only state a well-established fact, that all the essential and balsamic oils of aromatic trees and plants are excellent antiseptics, they readily volatilise, and in doing so liberate ozone, thus exercising powerful antiseptic influence. This power of liberating ozone makes eucalyptus and other aromatic oils valuable for use in sick-rooms, and in fact in all rooms that are continuously occupied. They act better if diffused through the air by means of a spray diffuser. If the bedroom and the pillows are sprayed at night the sleeper will sleep more comfortably, and awake in the morning more refreshed from sleeping in an ozonised atmosphere.

Eucalyptus is a true disinfectant, as it has the power of destroying the active matter or the infective germs generated in and discharged by a person passing through any of the eruptive or infectious fevers, and which, received by a healthy person into his system, develops the same train of symptoms, the same fever from which the former was suffering. Eucalyptus destroys the malarial poisons, which in the human system develop the various short or long malarial fevers, such as ague, jungle fever, Roman fever, rock fever, influenza, etc.; of this we may now rest assured from the experience gained in Italy, Africa, India, and America, by planting the tree extensively in malarial dis-

tricts. In California thousands of acres have been planted, and the Americans are yearly extending their plantations, surrounding their houses and locations with the trees. It is easy to foresee that our chief supply of the oil of eucalyptus globulus, which is the only tree of the species they plant, will in future be derived from that country rather than from its native *habitat*, Australia. The Australians having the native forests for their supply, do not feel the stimulus to plant, and their supply will diminish.

It is more than twenty years since that Dr. Budd published a pamphlet advocating the use of olive oil for inunction in scarlet fever, not with the view of destroying the infective germs, but of saturating the cuticle and preventing it from being diffused through the air. The use of the oil was attended by great inconvenience, in that it soiled the linen and became rapidly rancid by the high temperature of the patient. Since that time I have sought some method of disinfection by inunction that would destroy all the infective germs stored in the cuticle, so as to render it when cast off perfectly innocuous. There were many disinfectants—carbolic acid, permanganate of potash, creolin (Jeyes' fluid), sanitas, etc., but none of these were suitable. Carbolic acid must be dissolved in water, oil, or fat. A watery solution of a disinfectant would not do to apply to the whole surface of the skin of a child in the first stage of scarlet fever with a temperature of 103° to 105° , and the carbolic acid could not be used strong enough to destroy the infection owing to its caustic nature. For the above reason Jeyes' fluid, sanitas, and other watery solutions were unsuitable. Antiseptics mixed with fixed oils or fat were attended by several objections. The oil or fat applied to the whole surface would interfere materially with the action of the skin, and the oil or fat would weaken their power. Spirituous solutions were also unsuitable, and the alcohol weakened their action.

Corporeal disinfection by inunction has been tried by medical men at various times. One recommended thymol mixed with vaseline, but the unctuous nature of the latter was disagreeable to the patient, and if applied to large surfaces of the body interfered with transpiration. No one would be surprised that the trial was a failure.

In June last there was published, in the *Medical Record*, a method of disinfection proposed by Dr. L. Mervin Mans. He says: "Sponge the patient thoroughly, morning and evening, with a tepid solution of corrosive sublimate, 4 to 1,000, as soon as the eruption makes its appearance. The hair and the secretions are also to be disinfected with the same. As

soon as the patient is permitted to leave the bed, have the body washed with warm water and soap, then sponged with the 1 to 4,000 bichloride solution, wiped dry, and anointed with the following ointment—

Sodii biboratis, zinci oxidi āā ʒ iv.
Ol. Gaultheriæ ʒ ss., vaseline ʒ iv.”

This treatment is to be continued until desquamation is complete.

We have no record of the success of this treatment, nor of the number of deaths after the use of this poisonous disinfectant. I should think that no man of ordinary intelligence would venture to use a solution of bichloride of mercury of 4 to 1,000 strength twice a day for upwards of a week, applying it over the whole surface of the body of a young child, and continuing a weaker, though still strong, solution of 1 in 4,000 for several weeks longer, anointing the body also daily with a vaseline ointment that would most seriously interfere with the proper action of the skin. One German physician applies a bichloride of mercury solution to the pustules of small-pox, and another covers them with an ointment of salicylic acid, starch, and glycerine. Another, Dr. Bianchi, recommends in small-pox, baths and washings in water containing five per cent. of boric acid, and “the whole body is to be washed, using a clean sponge, with a 1 to 1,000 solution of corrosive sublimate.” “In mild cases the whole body is to be washed once with the corrosive sublimate solution, and twice with the boric acid solution, in the twenty-four hours. In grave cases, twice with each solution daily.” After washing, all the parts covered with eruption to be smeared with an iodoform ointment, 1.5 per cent. He does not say how many of the ninety-six cases so treated recovered or died. He says the treatment is rational; it diminishes the period of the eruption; practically isolates the patient; prevents suppuration; and limits contagion. What Dr. Bianchi claims for his corrosive sublimate treatment I claim for eucalyptus; and, although I have not had an opportunity of testing it, I firmly believe, from the power it possesses of killing the scarlet-fever poison, it would be equally powerful over small-pox. In the one case we are using a powerfully poisonous disinfectant, in the other one that is quite innocuous to the patient. These methods of disinfection have been made public since I commenced the treatment of scarlet fever by inunction. I had for some years given up the idea of disinfecting the skin through inability to find a suitable medium for applying the disin-

fectant, when, in May of last year, I was in a difficulty as to how I should isolate a child suffering from scarlet fever in a family where there were six other children. The child was a year and nine months old, the youngest of the family. The mother would not hear of its being sent to the hospital, and it was impossible to carry out any isolation in the usual way, as she had to attend to all the wants of the other children. I told her that all the children would have the disease if she kept the child in the house, but she said she would not part with her baby, and would risk the others having it. In this emergency I again thought of disinfecting the child, when I remembered having at my house a sample of Tucker's eucalyptus disinfectant, composed, as before stated, of essential oil and camphors, having no fixed oil nor alcohol in it. I determined to try it, and told the mother how I wished it used. She was to rub the child all over with it night and morning, not omitting any portion of the skin, and to sprinkle the bed and the floor of the room with it, so that the air should smell strongly of the vapour. I also gave the child eucalyptus oil in one-drop doses every four hours in an emulsion. When I first saw the child it had the scarlet-fever rash over the face, arms, and upper portion of the body. Its throat was so sore that it refused all food, and had not taken anything for two days; it had not slept during two days and nights, being fretful and crying all the time. On my second visit, the following morning, I found the child sitting up in bed eating a slice of bread and butter. The rash had all gone, and the temperature had gone down from 103° to 100.2° . The mother told me that after rubbing the child over with the fluid the previous night, it went to sleep and slept five hours, awaking apparently well, taking some milk without any difficulty in swallowing. I was quite astonished to see such a change in the child, and told the mother to go on with the disinfectant, rubbing it over night and morning for three days, then each night, after a warm bath, for four days more. The child was so saturated with the eucalyptus inunction, by inhalation of its volatile vapour, and by medication, that the disease appeared to have been stayed and every germ destroyed, as desquamation occurred only on the parts of the skin where the rash was seen. The other children had free access to the room, and none of them took the disease.

Several other cases were treated in a similar manner with like results. The fever abated after the first inunction, and the rash disappeared within twelve hours; desquamation occurring only where the rash had been seen on the

commencement of the treatment. None of the cases were isolated, other members of the family frequenting the room, and in one case a mother with a younger child living in the single room. I shall only relate other cases in detail which serve to illustrate the conclusions at which I have arrived as to the power of eucalyptus over the scarlet-fever poison, and, by analogy of action, over the pathogenic germs of all eruptive and malarial fevers.

The next case I shall relate was a boy eight years old. When first seen he had had the scarlet-fever rash out two days. A brother had been sleeping with him, and two other brothers occupied the same room; while the mother, and a sister six years old, slept in the sitting-room. The boy was anointed with the disinfectant, and sent to the hospital. The three other boys and the girl were directed to use the disinfectant for a week, rubbing it over their chests and sprinkling it on their shirt-fronts and about the room, that they might inhale the vapour continuously during the day; and sprinkling it over their pillows and sheets, that they might sleep in the midst of the vapour at night. The second day after the boy was removed the sister showed symptoms of the disease. She vomited, had a headache, a white furred tongue, and sore-throat. Her temperature was 103° , and pulse 118. My son, who saw her, told her she would have to go to the hospital unless she used plenty of the disinfectant and stopped the fever. She said she would not go to the hospital, so she took the bottle and saturated the pillow and sheets with the fluid. For the remainder of the day and the following night she breathed air saturated with the vapour, sleeping quietly. She was given two-drop doses of the oil in emulsion every four hours. When seen on the following day all symptoms of the fever had gone; no rash had appeared; her temperature was normal; she felt quite well, and had no recurrence of fever. She was given a warm bath, and the disinfectant was rubbed over the whole surface of the body as a precaution. The others all escaped the disease, and the boy sent to the hospital was kept six weeks at the public expense and died there.

The next case was a nurse in a family where there were three young children. When first seen she had the scarlet-fever rash out over her chest and arms; a sore-throat and headache having commenced about thirty-six hours previously. She was removed to the hospital, and Tucker's eucalyptus disinfectant was ordered to be freely used in the nursery. The children were kept in an atmosphere strongly impregnated with the eucalyptus vapour for three days and

nights. After that they were allowed out during the day. The use of the disinfectant was continued in the nursery for four or five days longer, when the children were considered safe from the development of the fever through any infection from the nurse.

The last case I shall relate is that of a girl about eleven years of age. When first seen, on the third day of the fever, the rash was fully out; the throat was very inflamed and swollen, and the tonsils were ulcerated. The temperature was over 104° ; the pulse 132. She had much difficulty in swallowing, and took very little nourishment. The eucalyptus fluid was freely sprinkled over the bed and about the room; it was rubbed over her whole body night and morning for three days, and then at night only for seven or eight days more. She took also three-drop doses of the oil every four hours. She felt relieved directly after the treatment was commenced, and the following day she could drink with less pain; but the ulcers did not heal for three days. The rash did not disappear, as in the other cases, but became very bright for two days, and then gradually faded. Desquamation commenced before the rash had disappeared, and finished on the fifteenth day. She had rheumatism in her wrists and ankles for a few days; these were rubbed with the eucalyptus. The glands on the left side of the neck swelled and were painful, the side on which the tonsil was most ulcerated. These glands were lightly rubbed every four hours with the fluid, and in a few days the swelling subsided. She had no albumen in her urine, which was examined daily from the fourteenth to the twentieth days, and on the twenty-first day she left London for Brighton. A sister of this girl slept with her until I saw her on the third day; after that she did not sleep with her, but I told the mother she had better spend much of her time in the same room, that she might inhale the vapour of the disinfectant continuously, with the view of destroying any of the fever poison she might have taken from her sister. She spent most of the first three days in the room, sitting by her sister's bed, and reading to her. On the 31st of October I felt bound to conform to the provisions of the new Act. I reported the case to the Sanitary Authority, and separated the two sisters. Two days afterwards, which was five days from the date that they ceased to sleep together, the sister showed some signs of the disease. She had headache, sickness, and a coated tongue, and felt very ill. I used the disinfectant freely about her, and at the end of the second day she was well again. There were three

other children in the house, but none of them took the infection. There was no sheet used over the door, the disinfection of the patient serving to isolate her from those close to her bedside. The vapour of the disinfectant inhaled with every breath destroyed all the infective germs proceeding from the mucous membrane of the mouth, throat, or nose. The inunction of the skin destroyed all infection proceeding from the surface of the body, and the secretions were all disinfected immediately after they were passed. With an atmosphere full of this powerful disinfectant, there is no need for the doctor or nurse to take those elaborate precautions against the risk of conveying infection to others that amateur sanitarians so strongly recommend in the daily press. The aromatic disinfectants are eliminated chiefly through the kidneys; in this way they destroy the germs stored in the epithelium of those organs, and it is hoped we shall find by further experience that it will prevent the development of desquamative nephritis, with its attendant danger to life and health. Those cases that I have treated have not had any symptoms of nephritis, nor the slightest trace of albumen in their urine. From the experience gained by the above treatment of scarlet fever during the last twelve months, I have determined the following conclusions:—

1. That no isolation of the patient in the way now practised is necessary. The skin, mucous membranes, secretions, and breath being so disinfected that he cannot communicate the disease to others, although daily in the same room.

2. In cases treated by this method of inunction during the first day of the fever the disease is arrested: no rash appears and no desquamation follows, the inhalation of the vapour being sufficient to produce this result. It is probable that in such cases so checked the patients may be protected from another attack, as by inoculation.

3. Children who have been exposed to the infection for two or three days, by inhaling the vapour diffused in the air of their rooms, are preserved from the disease.

4. The sequelæ are lightened and prevented, desquamation is hastened, the falling cuticle being incapable of conveying the disease through its complete disinfection; consequently it is not necessary to enforce six or eight weeks' isolation until its completion.

5. The specific fever and the development of the germs of the disease terminating in six or seven days, the skin and mucous membranes being kept under the influence of the disinfectant until the tenth day, the patient is then safe to mix with others.

6. The bedding requires no further disinfection, as it is thoroughly disinfected during the treatment of the patient. The volatile vapour penetrates every article, even the mattress. The room also requires no after disinfection, as every germ that escapes from the patient is killed by the vapour.

I find that to extend this paper further on the treatment of other infectious diseases by eucalyptus would take up too much of your time this evening. I will therefore merely observe that eucalyptus has been used most successfully in the treatment of diphtheria by Dr. Jules Simon and other French physicians; by Dr. Murray Gibbes in New Plymouth, who used the fresh leaves; and lately it has been successfully treated in an outbreak at Uxbridge.

It has been equally efficacious in whooping-cough when tried by Dr. William Hardewick and others.

In my own experience it prevents the spreading of the infection of measles and chicken-pox.

It protects from malarial fever and influenza those daily inhaling the vapour, and sleeping in an atmosphere of it at night; and, lastly,—I believe it would destroy the infective germs of small-pox.
